

## **DETAILED ACTION**

### ***Specification***

1. The disclosure is objected to because of the following informalities:
  - a. Page 5, lines 18-19; page 6, lines 6-9; Page, 7, lines 6-9; page 8, line 4; it appears multiple times that variables were not properly inserted into the document, as disclosed in the instant application for example the frequency, phase, and time are all disclosed as boxes.
  - b. Page 7, line 2, "200in" should read -(200) in--
  - c. Page 9, line 11, the tab should be replaced with a double space.
2. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.

- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A “Sequence Listing” is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required “Sequence Listing” is not submitted as an electronic document on compact disc).

Appropriate correction is required.

### ***Drawings***

3. The figures 3-7 are objected to because the axes need to be labeled on all figures. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Appropriate correction is required.

### ***Double Patenting***

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1 and 10 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 14 respectively of U.S. Patent No. 7,365,864 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other because the patented claims 1 and 10 discloses all the limitations of the instant claims 1 and 10 but fails to explicitly disclose the limitation such as: "generating a spatially periodic refractive index disturbance in a gas or liquid medium contacting the film (22) via heat transfer (25) from the film (22) to said medium;". However, the claimed limitation is inherent since thermal grating is a composition of changing thermal currents which inherently have periodic refractive indices. Also using a medium of gas or liquid contacting the film (22) via heat transfer is inherent as well since the claim does not specify that the device is in a vacuum and if there is a medium in contact with a film, heat would inherently transfer between medium.

As to claim 10, Gostein discloses a method, where the determining step comprises analysis of the signal waveform with an empirical calibration (claim 10).

### ***Claim Objections***

5. Claim 9 is objected to because of the following informalities:

- d. Claim 9 can not depend from itself and is believed that it should read --the method of claim 8--.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

**7. Claims 1-2, 6-9, 10-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Gostein et al. (U.S. Patent No. 7,365,864 B2 and Gostein hereinafter)**

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

As to claim 1, Gostein discloses a method for measuring a film (22) comprising:

irradiating the film (22) with a spatially periodic optical excitation field (3, 3') in order to generate a thermal grating (col. 2, lines 17-20; where the structure is a thin film i.e. as noted from title of invention)

generating a spatially periodic refractive index disturbance (i.e. thermal grating is a composition of changing thermal currents which inherently have periodic refractive indices) in a gas or liquid medium contacting the film (22) via heat transfer (25) from the film (22) to said medium (col. 1, lines 40-47; where as disclosed the local heating would inherently heat the air directly above the thin film);

diffracting a probe laser beam (6) off the refractive index disturbances in the said medium to form a signal beam (6') (col. 2, lines 20-21; where inherently the probe beam is propagating through the index of refraction disturbances caused by the local heating);

detecting the signal beam (6') as a function of time to generate a signal waveform (col. 2, lines 21-23); and

determining at least one property of the film (22) based on the signal waveform (col. 2, lines 23-25;).

As to claim 2, Gostein discloses a method wherein the film (22) comprises a metal film (col. 3, lines 7-11).

As to claim 6, Gostein discloses a method, where the medium in contact with the film is air (col. 2, lines 64-65; where implicitly the medium above the substrate that contains the thermal grating is air).

As to claim 7, Gostein discloses a method, wherein the refractive index disturbance (i.e. the thermal grating contains the disturbance being a variation in

refractive index) in the medium is associated with the acoustic wave (col. 2, lines 64-65).

As to claim 8, Gostein discloses a method where the acoustic wave in the medium causes low frequency modulation (200) of the signal waveform (col. 2, lines 64-65; where inherently the low frequency oscillations are a result from the acoustic waves in air).

As to claim 9, Gostein discloses a method where the determining step is based on the analysis of the said low-frequency modulation (200) of the signal waveform (col. 2, line 65 thru col. 3, line 2).

As to claim 10, Gostein discloses a method, where the determining step comprises analysis of the signal waveform with an empirical calibration (col. 2, lines 52-54).

As to claim 11, a method, where the determining step comprises analysis of the signal waveform with a theoretical model comprising calculation of optical absorption by the film (22) (col. 1, lines 40-47);

analysis of thermal diffusion (i.e. local heating) (25) causing temperature increase in the gas (i.e. air) or liquid medium in contact with the film (22) (col. 1, lines 44-47);

analysis of the acoustic wave excitation caused by the temperature increase (col. 1, lines 48-52);

analysis of the probe beam (6') diffraction off the refractive index disturbance (i.e. thermal grating) caused by the temperature increase (25) and acoustic waves (27) in the medium (col. 1, lines 40-52).

As to claim 12, Gostein discloses a method, where the at least one property comprises a thickness of the film (22) (col. 3, lines 13-15).

As to claim 13, Gostein discloses a method, where the at least one property comprises a presence of the film (22) (col. 3, lines 15-17; where inherently if one is measuring thickness of a film a film is required to be present).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).



**10. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being obvious over Gostein in view of Nelson (U.S. Patent No. 5,812,261 and Nelson hereinafter).**

The applied reference has a common assignee in the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(I)(1) and § 706.02(I)(2).

As to claim 3, Gostein does not explicitly disclose a method where the film (22) is a metal film with a thickness less than 100 angstroms.

However, Nelson does disclose in (col. 3, lines 48-51) where the film thickness can be measured within tens of angstroms.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Gostein with a smaller thickness range to

provide the advantage of a more adaptable device that can measure even smaller film thicknesses when needed.

As to claim 4, Gostein does not explicitly disclose a method wherein the film (22) is deposited on an underlayer that is transparent to the excitation radiation.

However, Nelson does disclose in (col. 2, lines 47-50) where the sample can be in either the outer or underlying layer and that it is obvious to one of ordinary skill in the art that an order for the sample to be measured light would have to pass through the outer layer to heat up the lower layer to form the thermal grating.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Gostein with a transparent outer layer to provide the advantage of being able to form the desired thermal grating on the air medium above the sample.

As to claim 5, Gostein does not explicitly disclose a method, wherein the film (22) is deposited on the underlayer characterized by a smaller absorption coefficient at the excitation wavelength compared to the film material.

However, Nelson does disclose in (col. 2, lines 47-50) where the sample can be on the underlayer and it is obvious to one of ordinary skill in the art, that in order to transmit light to the sample being measured one would obviously not want all the light to be absorbed before reaching the sample.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Gostein by providing a lower absorption

coefficient in order to provide the advantage of being able to excite the sample that is intended to be analyzed with the most amount of light as possible.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL LAPAGE whose telephone number is (571)270-3833. The examiner can normally be reached on Monday Through Friday 7:30AM-5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur Chowdhury can be reached on 571-272-2287. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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